USE OF ARTIFICIAL INTELLIGENCE IN LABOUR WORKFORCE: A CRITICAL APPRAISAL

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TABLE OF CONTENTS

1. INTRODUCTION 3

2. STATEMENT OF PROBLEM 8

3. RESEARCH OBJECTIVES 9

4. REVIEW OF LITERATURE 10

5. HYPOTHESIS 12

6. RESEARCH QUESTIONS 12

7. SCOPE AND LIMITATIONS OF THE STUDY 13

8. RESEARCH METHODOLOGY 14

9. EXPECTED OUTCOME OF THE STUDY 14

10. SIGNIFICANCE OF THE STUDY 14

11. SCHEME OF CHAPTALIZATION 15

12. BIBLIOGRAPHY AND WEBLIOGRAPHY 16

13. APPENDIXES 22

INTRODUCTION

This research focusses on the impact of Artificial Intelligence and automation on the unorganized labour population in India. The unorganized sector in India is a significant contributor to the country's economy, accounting for over 90% of employment and almost 50% of the country's gross domestic product (GDP). [1]However, this sector is also marked by high levels of poverty, inequality, and vulnerability. Many workers in the unorganized sector are not protected by labor laws or social security schemes, and are often paid low wages and have few opportunities for skill development or career advancement.

Against this background, there is a growing concern about the potential impact of AI and automation on the unorganized sector in India. While these technologies have the potential to increase efficiency and productivity, they may also lead to job displacement, wage stagnation, and other negative impacts on workers. Given the importance of the unorganized sector in India, it is essential to understand the potential impacts of AI and automation on this sector and to identify ways in which these impacts can be managed and mitigated. [2]

To understand these significant changes in the nature of work better, we need to trace the history of previous Industrial Revolutions. The first Industrial Revolutions took place in Europe and North America from the mid-18th century, when mass migration from farms to cities started and factories were set up. [3]The first technological inventions took place during this period, such as machine tools, iron, and textile industries. The Second Industrial Revolution extended from the 1870s to the early 20th century, benefitting mostly the European and North American continents. It was characterized by the rapid rate of industrialization and major technological breakthroughs such as telegraphs, railroads, gas and electricity. It gave a major boost to the industries that were set up and also resulted in the migration of people from rural areas to urban areas. It can be said to be the first significant globalization with advancements in communication techniques and better connectivity. The Third major Industrial Revolution, which again shifted the tides from mechanical technologies to digital technologies, occurred from the mid-1900s to the 1990s. It began with the invention of the transistor and moved towards the adoption of computers, the rise

[1] Prasanna Mohanty, *Labour reforms: No one knows the size of India's informal workforce, not even the govt*, BUSINESS TODAY (JUL 15, 2019) Available at: Labour reforms: No one knows the size of India's informal workforce, not even the govt - BusinessToday

[2] Nibedita Saha, *Rise of AI in the Indian Economy*, INDIai (Dec 28, 2020) Available at : Rise of AI in the Indian Economy (indiaai.gov.in).

[3] Schwab, Klaus, *The Fourth Industrial Revolution*. London, England: Portfolio Penguin. 2017

of the information technology industry, and the arrival of the internet. This paved the way for the Fourth Industrial Revolution, beginning in the 2010s, which further builds on the development of technologies such as Artificial Intelligence, Robotics, the Internet of Things, blockchain etc.[4] The Fourth Industrial Revolution blurs the lines between humans and machines, with technologies embedded in every aspect of our modern life. With the coming up of the Fourth Industrial Revolution, the world slowly began to adapt to technologies based on Artificial Intelligence.

Emeritus Stanford Professor John McCarthy coined the term Artificial Intelligence (hereinafter AI) in 1955 as "*the science and engineering of making intelligent machines"*. where Intelligence, according to him, is "the computational aspect of achieving goals in the real world".[5] Various organizations have given several definitions of Artificial Intelligence, but currently, there is no legal definition for Artificial Intelligence. So, it is a generally accepted concept that Artificial Intelligence (AI) programs are software programs with the ability to perform complicated tasks as humans do. AI consists of feeding complex data into machines and making them react to different situations. It relies majorly on self-learning patterns where the machine can give answers to the never answered questions like a human would do. [6]AI programs are more focused on complicated tasks than just solving arithmetic problems. One such example of Artificial Intelligence is Deep Blue, an IBM supercomputer which defeated the chess champion, Garry Kasparov.

Looking at it from the viewpoint of development and growth, it is predicted, as per reports by Mckinsey Global Institute, that AI is estimated to deliver an additional economic output of more than 12 trillion USD by 2030, increasing the global GDP by 1.2% annually. [7] According to an Accenture Group report, 'Rewire for Growth', AI is touted to have the potential to add around $900 billion to the Indian market by 2035. Such potential must be used in a wise manner, or it will pose many obstacles. [8] It's a two-edged sword for India, as on one side Artificial Intelligence is proposing a promising future, on the other hand, there is a vast majority of workers in the

[4] Alejandro Lavopa and Michele Delera,*What is the Fourth Industrial Revolution?* INDUSTRIAL ANALYTICS PLATFORM (UNIDO.ORG) (January 2021)

[5] McCarthy, J. and Wright, P, TECHNOLOGY AS EXPERIENCE, The MIT Press, London (2004).

[6] John McCarthy, WHAT IS ARTIFICIAL INTELLIGENCE? 34-37 (2004).

[7]Jacques Bughin et al, *Notes from the AI frontier: Modeling the impact of AI on the world economy*, MCKINSEY GLOBAL INSTITUTE,(Sept 2018). *available at* https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-AI-frontier-modeling-the-impact-of-ai-on-the-world-economy (last visited 10 Aug, 2022).

[8] REKHA M. MENON, *Rewire for growth Artificial Intelligence (AI) for Economic Growth in India,* ACCENTURE (April,2021). *available at* https://www.accenture.com/_acnmedia/PDF-153/Accenture-AI-For-Economic-Growth-India.pdf#zoom=50 (last visited 15 Aug, 2022).

unorganized sector. India's labour market employs more than 50 crore workers in the organized and unorganized sectors of the country. A majority of these workers, i.e., around 90 per cent, are in the unorganized sector. The Central Statistical Organization defines an unorganized or informal sector consisting of enterprises that produce for the market and do not have more than 20 or 10 employees with power.[9]

In early 2020, India was slowly adopting automation and AI technologies. But after the first national lockdown on the eve of 24 March 2020, the rate of adoption of these technologies has accelerated.[10] As per the report by Price Water Cooper (PWC), India was the biggest adopter of AI and automation technologies. India reported a 45% increase in adoption of AI-based technologies, while developed nations like the USA recorded a 35% rise, the UK 23% and Japan 28% following the outbreak of the virus.[11] Capital-intensive and labor-intensive sectors are more susceptible to being affected by the adoption of Artificial Intelligence. Post-lockdown, these sectors are most likely to accelerate their automation potential, which would further lead to mass unemployment.[12] This was attributed to a shift in adopting new business strategies owing to the difficulties posed by Covid-19 lockdown guidelines. For example, AI-enabled contactless delivery and services gained more attraction. AI was the go-to solution for the number of lockdowns that have taken place since then. The sectors which were most affected by the Covid-19 lockdowns due to a shortage of labour force were the biggest adopter of AI-based solutions.[13] Artificial Intelligence technologies were slowly becoming a more prominent part of the workforce, and the COVID-19 pandemic pushed this development a little further. The pandemic forced millions of working people out of jobs, and robots and AI replaced them in no time. This is not a new trend, given that our history provides evidence of machines making jobs obsolete since the time humans started inventing machines. The COVID-19 pandemic further incentivized why AI would be the way forward for the human workers in a pandemic unsafe for humans turned out

[9] National Statistical Commission Government of India, REPORT OF THE COMMITTEE ON UNORGANIZED SECTOR STATISTICS (2012) *available at* http://archive.indianstatistics.org/datadocuments/nsc_report_un_sec_14mar12.pdf (last visited 11 Aug, 2022).

[10] *PM calls for complete lockdown of entire nation for 21 days,* PRESS INFORMATION BUREAU *(*March 24, 2020*). Available at https://pib.gov.in/newsite/PrintRelease.aspx?relid=200658 (*last visited 12 Aug,2022).

[11] PwC India Survey, SIGNIFICANT INCREASE IN OPTIMISM AROUND AI IN INDIAN ORGANISATIONS, SEES HIGHEST INCREASE IN THE USE OF AI DURING THE PANDEMIC ,PwC India (2020). Available at https://www.pwc.in/press-releases/2020/significant-increase-in-optimism-around-ai-in-indian-organisations-sees-highest-increase-in-the-use-of- ai-during-the-pandemic.html (last visited 13 Aug, 2022).

[12] *Id*.

[13] *Id.*

to be an economic liability, as there were a number of lockdowns to ensure the safety of the workers and to lessen the contagion of the disease. But it got the companies thinking that had there been automated workers controlled by AI, this would not have been the case. AI-controlled robots do not need time off or face other safety hazards. All these benefits from robots, AI and other automation-based technologies do not translate the same for the workers who would be replaced and would find it difficult to get work when there are much better workers in the form of machines.

The major concern regarding the adoption of these technologies by industrial establishments is the potential of replacing the labour workforce. Moreover, industrial establishments will not be hesitating to downsize their workforce, given the increasing opportunities in this field. One of the major issues is that there are no adequate safeguards in the old labour laws or the new labour codes regarding the replacement of workers by machines. Although there are fleeting mentions under the Industrial Relations Codes, 2019 section 70, regarding the retrenchment of workers, it makes it mandatory that at least one month's notice be given to the workers who have been in continuous service for not less than a year under an employer.[14] However, these provisions do not answer the questions as to what to do if there is an unavailability of a job elsewhere. There is an underlying assumption that the employee who is fired would be able to find a similar type of employment elsewhere. But keeping in view the advancement in technologies, this would not be the case as it is predicted that India has at least 52% automation potential, which means that there is a high probability that the jobs we have now will most likely be replaced by AI in future[15]. So, we would see an increase in the number of job losses due to a lack of skills. The increasing adoption of AI will increase competition in different markets, leading others to also adopt the same technology to sustain. Although developments cannot be stopped, laws can be formulated or amended to address the redundancy issues that may exist because of this technological shift. So, the revised retrenchment policy must be based on the assumption that the fired employee will not be able to find similar employment elsewhere. It is essential that not just the sudden redundancy be tackled by appropriate retrenchment policy, but the employees should also be trained for the new jobs in new areas.

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[14] PRS Legislative Research, *The Industrial Relations Code, 2019,(PRS LEGISLATIVE RESEARCH) Available at The Industrial Relations Code, 2019 (prsindia.ohttps://prsindia.org/billtrack/the-industrial-relations-code-2019rg)*

[15] James Manyika and Kevin Sneader, *AI, automation, and the future of work: Ten things to solve for,* McKinsey *Global Institute (June 1, 2018) Available at : AI, automation, and the future of work: Ten things to solve for (Tech4Good) | McKinsey.*

According to NITI Aayog, India's strategy for adopting AI should include skilling and reskilling our workforce as technology alters the nature of professions and modifies the standards for technological proficiency. To meet the shifting demands of the labour market, there is an urgent need to upskill the current workforce and cultivate future potential. This might be accomplished by implementing decentralized teaching techniques and forming partnerships with the private sector and educational institutions to set certification standards that have value. Additionally, it is important to identify and promote new job opportunities, such as data annotation, because they could replace a sizable section of the labour that may become redundant as a result of rising automation.[16]So, India's strategy for Artificial Intelligence might be seen as a critical step in meeting the requirement for reskilling the employees and promoting new jobs as necessary steps toward ensuring a secure job market in the future.[17]

During recent times the central government has proposed to replace at least 44 of the existing labour laws with four consolidated labour codes, which are the Code on Wages, 2019; Occupational Safety, Health and Working Code,2019, Industrial Relations Code, 2019 and Code on Social Security, 2019.[18] The main objective of the government was to simplify and modernize labour laws and regulations. The codes majorly aim to cover the workers working in small firms, retrenchment, strengthening the implementation of labour enforcement and encouraging the bargaining power of labour. Through these four Labour Codes, it has been ensured that all these workers will get the benefit of Labour Laws. Now all workers of the organized and unorganized sectors will get the minimum wages, and a large section of workers in the unorganized sector would also get social security. [19]

Many countries are coming forward to tackle the problem of employment creation and growth. For example South Korea, which is the most automated country having the highest density of robots in the world. This problem of wealth distribution was addressed by way of taxation, this

[16] Government of India, NITI Aayog, NATIONAL STRATEGY FOR ARTIFICIAL INTELLIGENCE (2018).

[17] *Id.*

[18] Ministry of Labour, Government of India,REPORT OF THE NATIONAL COMMISSION ON LABOUR, (2002) available at http://www.prsindia.org/uploads/media/1237548159/NLCII-report (last visited at 10 Aug 2022).

[19] Ministry of Labour and Employment, NEW LABOUR CODE FOR INDIA,GOVERNMENT OF INDIA (2021) available at https://static.pib.gov.in/WriteReadData/specificdocs/documents/2021/nov/doc202111101.pdf (last visited at 20 July 2022).

approach was taken by South Korea with respect to rapid automatization. The Moon Jae- In government proposed that tax and financial incentives which were given to companies were to be reduced for those who choose to employ robots. This was the approach taken whilst updating tax laws which had under previous governments allowed tax deduction benefits were provided to businesses who were willing to invest in infrastructure. This allowed for a 3-7% tax reduction for corporations. Through the implementation of robot taxation, the government envisioned that reducing tax benefits by a per cent could act as direct taxation on robots and industrial automation. Although there are arguments which say that such taxation would stifle innovation, it would be ignorant not to take notice of the plight of the workers who will be replaced, who are often not very well educated, like the majority of the working force in India, and would be left vulnerable if no safeguards are put in place for their protection.

Similarly other countries such as Germany has a strong emphasis on vocational training and education to ensure that workers have the skills needed to transition to new roles and industries. The country also has a system of retraining programs for workers who are displaced due to automation.In Denmark, the government has implemented a "flexicurity" model that combines flexibility for employers with security for workers, which includes programs to help workers transition to new roles and industries. The Denmark government also support companies to work together with the educational institutions to ensure that the education provided is aligned with the labor market needs. In Finland, the government has implemented a "lifelong learning" strategy that encourages workers to continuously update their skills and knowledge, in order to adapt to changing job market and technological developments. Similarly, Canada and the United States have implemented initiatives to support workers affected by automation, such as retraining programs and support for small businesses to adopt new technologies.

Through this research, I want to find a plausible solution where the Government, industrialists and other stakeholders adopt socially regulated and responsible AI and automation keeping in mind the socio-economic conditions of the country. There is a need to address the issue that India is not prepared to deal with the future job losses that would be the result of mass job displacement in countries like India and China, where there are large numbers of cheap labour available. It is better to have proper social security regulations in place and provide for skill development for workers for jobs of the future.

STATEMENT OF PROBLEM

The unorganized sector in India employs a significant portion of the workforce and is characterized by informality, low wages, and poor working conditions. With the increasing adoption of AI and automation in various industries, there is a growing concern that the employment opportunities and livelihoods of the workers in this sector will be negatively impacted. However, there is limited research on the specific ways in which AI and automation are likely to affect the unorganized sector in India and the potential consequences of this impact. The present research aims to fill this gap by examining the potential impact of AI and automation on the employment and livelihoods of workers in the unorganized sector in India

1.The problem of employment displacement in the Fourth Industrial Revolution is not adequately addressed by the resources that are currently available.

2. Between the loss of jobs and the creation of new jobs, there would be a sizable lag if no solution is offered for the workers' job security during this time.

3.The assumption is fallacious that workers with present job skills will immediately be placed when new jobs are created.

4. Lack of policies and legislations on the issue of adoption of Artificial Intelligence and skill development of the current workforce.

RESEARCH OBJECTIVES

1. To analyze the historical implications of various industrial revolutions regarding changing the nature of jobs over time.

2. To understand the current state and employment prospects of the unorganized sector in India, and how vulnerable this sector is to displacement by AI and automation.

3. To examine the role of the government of India in regulating and addressing the impact of AI and automation on the unorganized sector.

4. To juxtapose the labour legislations in developing country India and a developed country like USA with regard to dealing with the issue of job displacement due to automation and AI.

REVIEW OF LITERATURE

Artificial intelligence (AI) and automation have been a topic of much discussion in recent years, with many experts predicting that these technologies will have a significant impact on the labor market. Specifically, there is concern that the widespread adoption of AI and automation will result in the displacement of jobs. In this literature review, we will examine the current state of research on the impact of AI and automation on employment and job displacement.

One of the key arguments made in the literature is that AI and automation will lead to significant job displacement, particularly in sectors that are heavily reliant on routine and repetitive tasks. For example, a study by Frey and Osborne (2017) predicts that up to 47% of jobs in the United States are at risk of being automated. Similarly, a study by the McKinsey Global Institute (2017estimates that up to 800 million jobs could be displaced worldwide by automation by 2030. However, not all experts agree that the impact of AI and automation on employment will be negative. Some argue that these technologies will ultimately lead to the creation of new, higher- skilled jobs. For example, a study by Brynjolfsson and McAfee (2014) argues that the displacement of jobs due to automation will be offset by the creation of new jobs in areas such as data analysis and machine learning. Additionally, several studies have suggested that the impact of AI and automation on employment will vary across different sectors and regions. For example, a study by Autor et al. (2018) found that the displacement of jobs due to automation has been concentrated in manufacturing and other routine-intensive sectors, whereas jobs in service-based sectors such as healthcare and educationare less likely to be automated.

In terms of the implications of AI and automation for workers, the literature suggests that these technologies will lead to a significant shift in the types of skills that are in demand. For example, a study by the World Economic Forum (2016) argues that the widespread adoption of AI and automation will lead to an increased demand for workers with skills in areas such as data analysis and problem-solving. In available literature suggests that the impact of AI and automation on employment and job displacement is a complex and multifaceted issue. While there is agreement that these technologies will lead to the displacement of jobs, there is also evidence to suggest that they will create new, higher-skilled jobs. Additionally, the impact of AI and automation is likely to vary across different sectors and regions. Thus, policymakers and organizations will need to consider the potential effects of these technologies and implement strategies to support workers in the transition to a more automated labor

market.

Cynthia Estlund in her book "Automation Anxiety: Why and How to Save Work," argues that automation and artificial intelligence (AI) technologies have the potential to displace jobs on a massive scale, leading to significant economic and social upheaval. However, she also posits that it is possible to mitigate the negative effects of automation through targeted policies and regulations. Estlund begins by providing a detailed overview of the current state of automation and AI technologies and their likely impact on the labor market. She also presents data on the jobs most likely to be impacted by automation, including those in manufacturing and retail. The author then examines the social and economic implications of job displacement, including increased inequality and reduced economic mobility. One of the key contributions of the book is Estlund's examination of the role of the state in addressing the challenges posed by automation. She argues that policymakers have a crucial role to play in mitigating the negative effects of automation through targeted policies and regulations. She provides a number of specific policy recommendations, including increasing investment in education and training programs and strengthening worker protections such as unemployment insurance and collective bargaining rights. Throughout the book, Estlund is clear that the issues at stake in the age of automation are not only economic, but also social and political. The author is able to successfully navigate the complex terrain of technology, politics, and economics and presents a well-argued case that automation need not lead to mass unemployment and widespread social dislocation, but it will depend on how we choose to respond to it.

In "The Fourth Industrial Revolution" Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, presents a thought-provoking analysis of the rapid technological advancements that are shaping the world today. He argues that we are currently in the midst of a "Fourth Industrial Revolution" characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres. Schwab begins by providing a brief overview of the previous industrial revolutions and the impact they had on society. He then goes on to explore the key technological trends driving the Fourth Industrial Revolution, including advanced robotics, artificial intelligence, the Internet of Things, and biotechnology. He also delves into the implications of these technologies for various industries and sectors, including healthcare, education, and transportation.

One of the strengths of the book is Schwab's emphasis on the importance of collaboration and cooperation in navigating the challenges and opportunities presented by the Fourth Industrial Revolution.

He argues that governments, businesses, and individuals must work together to ensure that the benefits of these technologies are distributed equitably and that their negative impacts are minimized. He also calls on leaders to take a holistic and long-term perspective in their decision- making, rather than being driven by short-term gains. Schwab provides several policy recommendations and best practices for organizations, governments, and individuals to navigate this revolution. He stresses on the importance of investing in education, training, and lifelong learning; promoting inclusive and sustainable growth; fostering innovation and entrepreneurship and finding ways to ensure that the benefits of the Fourth Industrial Revolution are shared more widely The glaring gap in this book is that this was a big declaration to the world of the upcoming changes and the changing nature of work. This book is introductory in nature, which enlightens the world with the new concept of the forthcoming Industrial revolution 4.0 and its implication. This book predicts the problems of the future but doesn't go deeper in the study of problems that would be faced by developing countries. It sets the pace for more discussions on this issue, which is more general in nature. It doesn't provide solutions to the problems of job losses and skills required for the future of work. With my research, I want to find a viable solution that will work for the changing job environment and future of work. And look into solution for reskilling the existing population for the imminent future.

HYPOTHESIS

H1: The adoption of AI and automation in industries in India will lead to significant job displacement, particularly in sectors with high levels of manual labor.

H2: The issue of job displacement in India due to AI and automation will disproportionately impact lower-skilled and lower-paid workers, leading to increased income inequality and social unrest.

RESEARCH QUESTIONS

1. Whether the industrial revolutions of the 18th, 19th, and 20th centuries negatively impacted the working conditions and employment opportunities for labor?
2. Whether a developing country like India with a large-scale labour population would be negatively affected by the accelerated adoption of AI and automation?
3. Whether the Government in India has taken the required steps with regard to changes brought by

automation and AI and policy changes that need to be incorporated or modified in the existing framework?

4. What are the most effective policy and legislative measures that have been implemented in India and other countries to provide skill development opportunities for unskilled workers in order to help them adapt to the changing job market brought about by the increased adoption of AI and automation?

SCOPE AND LIMITATIONS OF THE STUDY

Scope: The scope of the study will be to understand the impact of AI and automation on the employment and income prospects of workers in the unorganized sector in India. The study will focus on industries where AI and automation have been adopted, and will examine the effect on wages, job opportunities, and overall economic growth in these industries. The study will also examine the strategies that workers in the unorganized sector can adopt to mitigate the negative effects of AI and automation on their employment prospects, as well as the role of the government in regulating and addressing the impact of AI and automation on this sector.

Limitations: The study will be limited to the analysis of data from industries in India where AI and automation have been adopted. The study will not be able to predict the future impact of AI and automation on the unorganized sector, as the adoption and impact of these technologies is likely to change over time.

RESEARCH METHODOLOGY

This study will adopt a mixed-methods approach, using both doctrinal and empirical.

Data Sources: The study will utilize a range of data sources, including government statistics, industry reports, and academic literature. In addition, the study will also include primary data collection through in-depth interviews with workers, employers, and experts in the field of AI and the labour workforce.

Data Collection Methods: The study will employ a variety of data collection methods, including desk research, online surveys, and in-depth interviews. The desk research will involve reviewing and analyzing existing data on the use of AI in the labour workforce in India, including government statistics, industry reports, and academic literature.

Overall, the research methodology for this study will involve a combination of desk research, online surveys, and in-depth interviews, and will utilize both qualitative and quantitative data analysis techniques. This mixed-methods approach will allow for a more comprehensive and nuanced understanding of the use of AI in the labour workforce in India.

EXPECTED OUTCOME OF THE STUDY

The expected outcome of a study on the impact of AI and automation on the unorganized sector in India would be to gain a better understanding of how these technologies are affecting employment and income prospects for workers in this sector. Some specific outcomes that might be expected from such a study could include:

1. An assessment of the industries in the unorganized sector where AI and automation have been adopted, and the extent to which these technologies have been implemented.
2. An evaluation of the impact of AI and automation on wages, job opportunities, and overall economic growth in the unorganized sector in India.
3. An examination of the strategies that workers in the unorganized sector can adopt to mitigate the negative effects of AI and automation on their employment prospects.
4. A review of the role of the government of India in regulating and addressing the impact of AI and automation on the unorganized sector.
5. Recommendations for policies and programs that could be implemented to address the impact of AI and automation on the unorganized sector in India.

Overall, the expected outcome of such a study would be to provide a better understanding of the impact of AI and automation on the unorganized sector in India, and to identify ways in which this impact can be managed and mitigated in order to promote the well-being and prosperity of workers in this sector.

SIGNIFICANCE OF STUDY

A study on the impact of AI and automation on the unorganized sector in India could be significant for a number of reasons:

The unorganized sector in India is a significant contributor to the country's economy, and understanding

the impact of AI and automation on this sector could have important implications for economic growth and development. The unorganized sector is also a major source of employment in India, and understanding the impact of AI and automation on employment and income prospects in this sector could have important implications for workers and their families. A study on the impact of AI and automation on the unorganized sector in India could provide insights into the ways in which these technologies are affecting different industries and occupations, and could help policymakers and practitioners develop strategies to address any negative impacts.

The findings of such a study could also be relevant for other countries that have a significant unorganized sector, as many of the challenges and opportunities faced by workers in this sector are likely to be similar across countries. Overall, a study on the impact of AI and automation on the unorganized sector in India could provide valuable insights into the ways in which these technologies are affecting employment, income, and economic growth, and could help policymakers and practitioners develop strategies to address any negative impacts and promote the well-being and prosperity of workers in this sector.

SCHEME OF CHAPTERISATION

CHAPTER I INTRODUCTION TO AUTOMATION, AI AND IMPACT ON FUTURE OF WORK

CHAPTER II HISTORICAL PERSPECTIVE- INDUSTRIAL REVOLUTIONS AND JOB DISPLACEMENT

CHAPTER III ANALYZING THE IMPACT OF AUTOMATION/ ARTIFICIAL INTELLIGENCE ON LABOUR SECTORS IN INDIA POST COVID-19.

CHAPTER IV: LABOUR LAWS AND SOCIAL SECURITY LEGISLATIONS IN INDIA

CHAPTER V: COMPARATIVE ANALYSIS OF SOCIAL SECURITY LEGISLATIONS

CHAPTER VI: IMPACT ASSESSMENT ON THE STAKEHOLDERS DUE TO AUTOMATION AND AI.

CHAPTER VII: CONCLUSION AND SUGGESTIONS.

LIST OF ABBREVIATIONS

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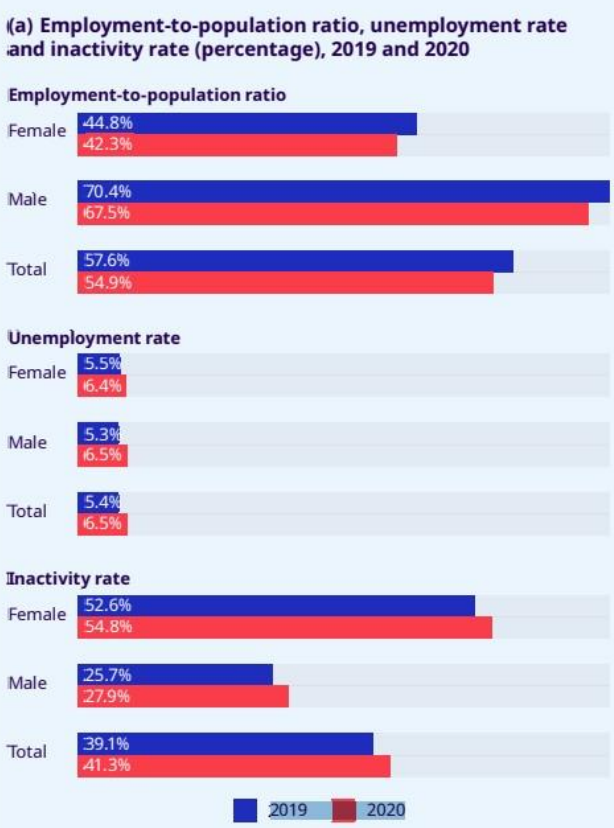
APPENDIXES

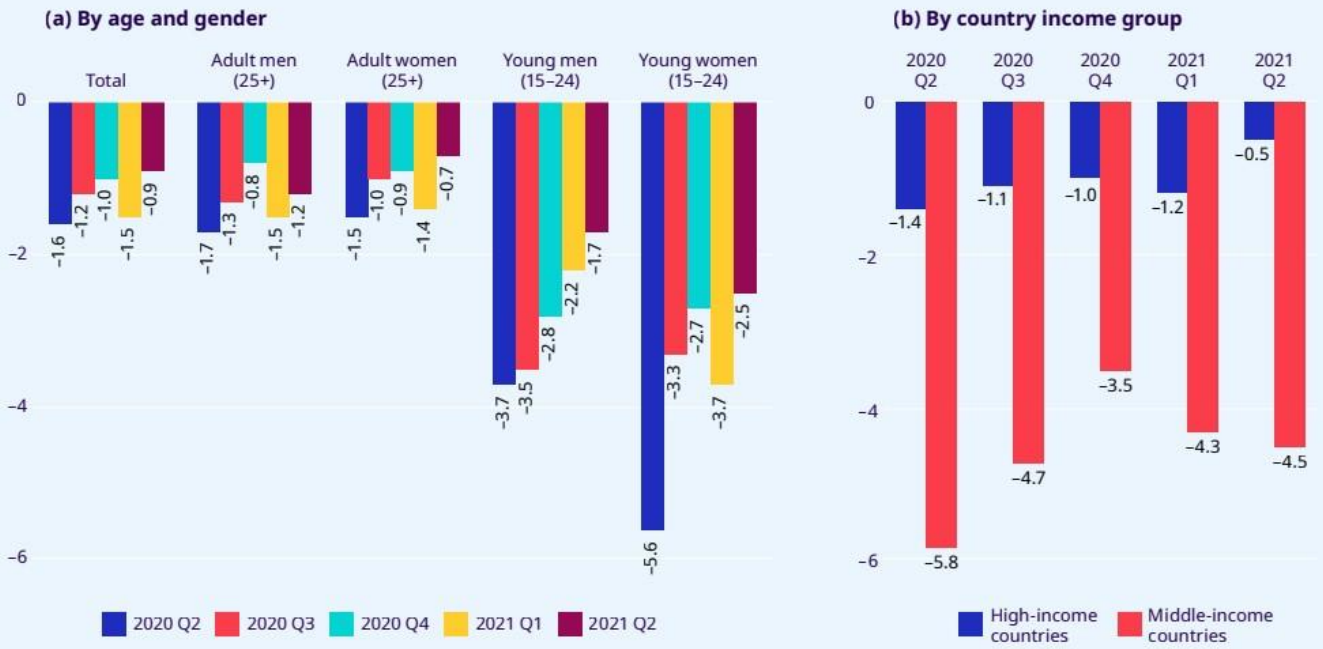
Figure 8. Key labour market indicators, global estimates, 2019–2020



Notes: For definitions of these indicators, see the https://ilostat.ilo.org/resources/concepts-and-definitions/

Source: ILO modelled estimates; authors' calculations.

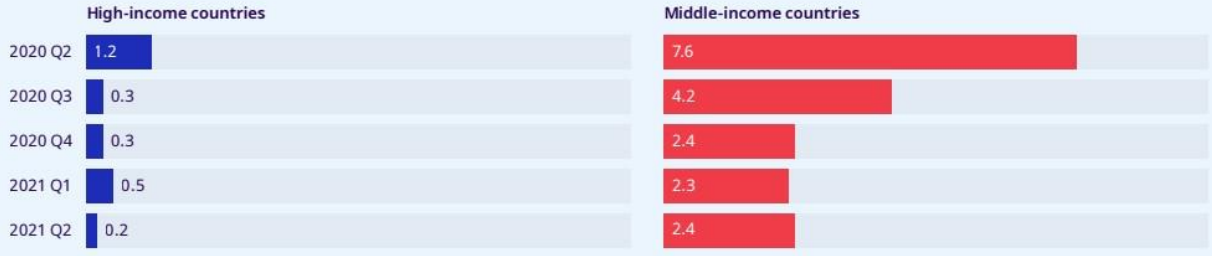
Figure 9. Change in employment-to-population ratio, 2020 Q2–2021 Q2 (percentage points)



Note: The sample of 39 countries is balanced over the period 2019 Q1–2021 Q2; the unweighted median value (not simple average) in this sample is used to minimize the impact of extreme values. The figures presented are the differences in the employment-to-population ratio (percentage points) relative to the same quarter in 2019.

Source: ILOSTAT; authors' calculations.

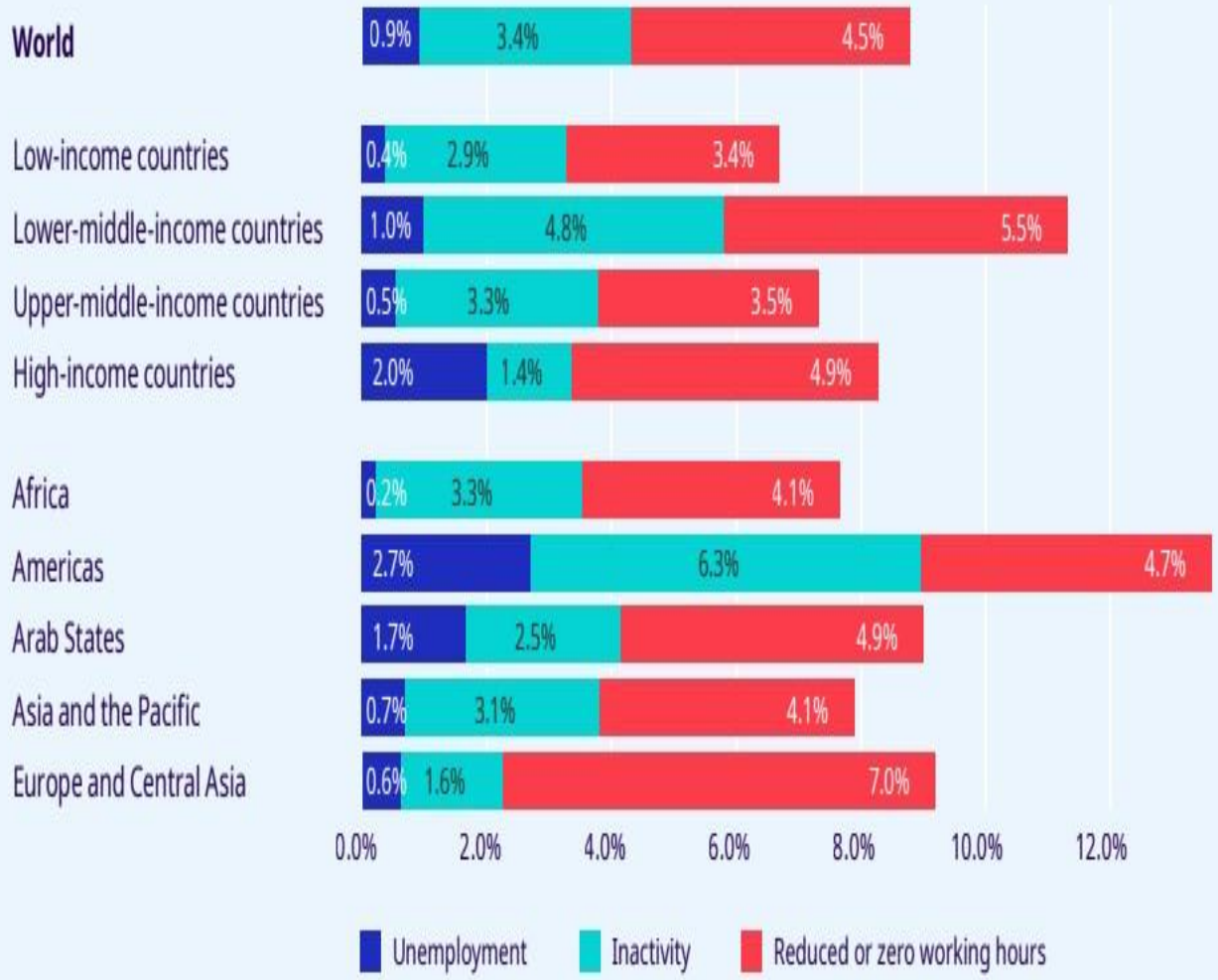
Figure 10. Change in inactivity rate, by country income level, 2020 Q2–2021 Q2 (percentage points)



Note: Sample of 39 countries (30 high-income and 9 middle-income countries) is balanced over the period 2019 Q1–2021 Q2; the unweighted median value (not simple average) in this sample is used to minimize the impact of outliers. The figures presented are the differences in the inactivity rate (percentage points) relative to the same quarter in 2019.

Source: ILOSTAT; authors' calculations.

Figure 7. Decomposition of working-hour losses into changes in unemployment, inactivity and reduced working hours, world and by income group and region, 2020 (percentage)



Note: The overall working-hour loss is decomposed into changes in unemployment, inactivity and reduced or zero working hours. Unemployment plus inactivity equals the total employment loss. Unemployment and inactivity have been transformed into their working-hour equivalent using the average working hours per week. The working-hour equivalent of changes in employment, unemployment and inactivity is computed using the estimated average working hours per week, which ranges from 35 to 45 hours per week across the income groups and regions. This differs from the 48-hours FTE equivalent presented in the previous section, where the same number of weekly working hours is used to make the estimates comparable across regions.

Source: ILOSTAT database, ILO modelled estimates.

Box 1. Annual employment losses understate the full impact of the COVID-19 crisis on the labour market in 2020 and 2021

Employment around the world is estimated to have declined in 2020 by 114 million relative to the level in 2019. However, this estimate understates the full impact, which can be gauged by looking at the difference in 2020 relative to the employment level that had been anticipated in the absence of the pandemic. This "no pandemic" scenario assumes the long-term trend in the labour force participation rate to hold in 2020 and that unemployment rates in 2020 are equal to their 2019 values. Global employment in this scenario is 30 million higher than in 2019, mainly owing to the growth of the working-age population.

Applying this "no pandemic" scenario, the estimated global employment loss in 2020 is considerably larger, at 144 million jobs (figure B1). At the same time, as discussed below, working-hour losses in 2021 are expected to translate more into employment losses than into reduced working hours. Compared with the "no pandemic" trend , the global employment loss is projected to decline from 144 million jobs in 2020 to 68 million in 2021 (if the baseline scenario is assumed for the projections, see below).

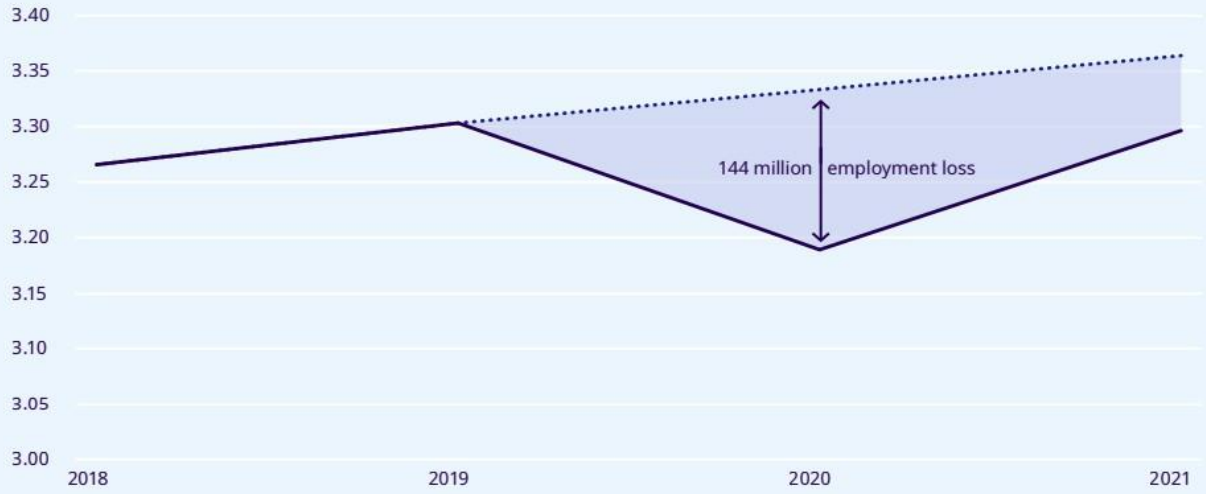



Figure B1. Global employment loss relative to the "no pandemic" scenario, 2018–21
(employment: billion people)